In the Claims:

1. (Previously Presented) An ultrasound method comprising:

delivering a pushing pulse for between about 0.025 to about 10 milliseconds from an ultrasound transducer array having a plurality of elements to a target region within a medium to displace the target region to a displaced position;

delivering a tracking pulse from the ultrasound transducer array to the target region; and

receiving a plurality of tracking signals from locations in the target region, each tracking signal being responsive to the tracking pulse, wherein the plurality of tracking signals comprise parallel beam formed signals.

2. (Canceled).

3. (Original) A method according to Claim 1 wherein the plurality of tracking signals detects the displaced position of the target region.

4. (Original) A method according to Claim 1 further comprising

delivering an initial tracking pulse from the ultrasound transducer array to the target region prior to the pushing pulse; and

receiving an initial tracking signal responsive to the tracking pulse in the target region to detect an initial position for the target region.

5. (Original) A method according to Claim 1 wherein the tracking pulses comprise a de-focused beam with respect to the target region.

6. (Original) A method according to Claim 4 wherein the tracking signals comprise multiple sums of differently focused delayed signals received at each of the plurality of elements in the ultrasound transducer array.

7. (Original) A method according to Claim 4 wherein:

delivering a tracking pulse comprises delivering the tracking pulse at a first intensity level; and

delivering a pushing pulse comprises delivering the pushing pulse at a second intensity level that is greater than the first intensity level.

8. (Original) A method according to Claim 7 wherein the second intensity level is a range between about 1.0 W/cm2 and about 10,000.0 W/cm2.

9. (Original) A method according to Claim 7 wherein the first intensity level is less than about 1.0 W/cm2.

10. (Original) A method according to Claim 1 wherein transmitting a tracking pulse and receiving a plurality of tracking signals are repeated for a single pushing pulse.

11. (Canceled).

12. (Original) A method according to Claim 1 wherein the ultrasound transducer array comprises a one dimensional ultrasound transducer array.

13. (Original) A method according to Claim 1 wherein the ultrasound transducer array comprises a two dimensional ultrasound transducer array.

14. (Original) A method according to Claim 1 further comprising detecting a region of greater stiffness relative to other regions indicated by a region of decreased displacement relative to other regions.

15. (Original) A method according to Claim 14 wherein the medium comprises a biological tissue, and the region of greater stiffness is a tumor.

16. (Original) A method according to Claim 15 wherein the tissue comprises breast tissue.

17. (Original) A method according to Claim 14 wherein the medium comprises a blood vessel and the region of greater stiffness comprises a hardened blood vessel.

18. (Original) A method according to Claim 14 wherein the medium comprises muscle tissue and the region of greater stiffness comprises muscle tissue with greater muscle tone relative to other regions.

19. (Original) A method according to Claim 1 further comprising detecting a region of lesser stiffness relative to other regions indicated by a region of greater displacement relative to other regions.

20. (Original) A method according to Claim 1 further comprising displaying an image based on a relative amplitude of the displaced position at a plurality of spatial points.

21. (Original) A method according to Claim 20 wherein the image comprises a two-dimensional image.

22. (Original) A method according to Claim 21 wherein the image comprises a three-dimensional image.

23. (Original) A method according to Claim 1 further comprising precompressing the target region prior to delivering the pushing pulse.

24. (Original) A method according to Claim 1 further comprising repeating the steps of delivering a tracking pulse and receiving a tracking signal responsive to the tracking pulse after the step of delivering the pushing pulse.

25. (Previously Presented) An ultrasound method comprising the steps of:

delivering a first tracking pulse from an ultrasound transducer array to a target region within a medium;

receiving a first set of tracking signals from locations in the target region responsive to the tracking pulse in the target region at the ultrasound transducer array to detect an initial position for the target region;

delivering a pushing pulse for between about 0.025 to about 10 milliseconds from the ultrasound transducer array to the target region to displace the target region to a displaced position;

delivering a second tracking pulse from the ultrasound transducer array to the target region;

receiving a second set of tracking signals from locations in the target region responsive to the second tracking pulse at the ultrasound transducer array to detect the displaced position of the target region, wherein the plurality of tracking signals comprise parallel beam formed signals; and

repeating sequentially the delivering a first tracking pulse, receiving a first tracking signal, delivering a pushing pulse, delivering a second tracking pulse, and receiving a second tracking signal to provide a series of cycles, the pushing pulses being delivered to different target regions during the series of cycles providing a plurality of displaced positions.

26. (Original) A method according to Claim 25 further comprising:

generating a plurality of displacement maps based on a relaxed position in the target region and the plurality of displaced positions; and then

combining the plurality of displacement maps to provide an image.

27. (Original) A method according to claim 25 wherein repeating sequentially further comprises delivering the pushing pulses from different transducer elements in the ultrasound transducer array to different target regions during the cycles.

28. (Currently Amended) A method for evaluating a blood vessel and/or cardiac tissue in a subject comprising:

delivering an acoustic radiation force pulse to a blood vessel and/or cardiac tissue;

detecting a mechanical property of [[a]] the vessel wall and/or cardiac tissue to provide at least first and second values associated with the mechanical property at at least two timing points during a cardiac cycle of the subject; and

comparing the first and second values~~, wherein the detected mechanical property comprises a dynamic response to radiation force excitation~~.

29. (Currently Amended) A method according to Claim 28 wherein a target region comprises blood vessel wall and/or cardiac tissue and wherein delivering an acoustic radiation force pulse and detecting a mechanical property comprises:

delivering a first tracking pulse from an ultrasound transducer array having a plurality of elements to a target region within a medium;

receiving a first set of tracking signals from locations in the target region responsive to the tracking pulse in the target region to detect an initial position for the target region;

delivering a pushing pulse from the ultrasound transducer array to the target region to displace the target region to a displaced position;

delivering a second tracking pulse from the ultrasound transducer array to the target region; and

receiving a second set of tracking signals from locations in the target region responsive to the second tracking pulse in the target region to detect the displaced position of the target region.

30. (Original) A method according to Claim 29 wherein:

delivering the first tracking pulse comprises delivering the first tracking pulse at a first intensity level; and

delivering a pushing pulse comprises delivering the pushing pulse at a second intensity level that is greater than the first intensity level.

31. (Original) A method according to Claim 30 wherein:

delivering a second tracking pulse comprises delivering the second tracking pulse at the first intensity level.

32. (Original) A method according to Claim 30 wherein the second intensity level is a range between about 1.0 W/cm2 and about 10,000.0 W/cm2.

33. (Original) A method according to Claim 30 wherein the first intensity level is less than about 1.0 W/cm2.

34. (Original) A method according to Claim 29 wherein the step of delivering a pushing pulse comprises delivering the pushing pulse for between about 0.025 to about 10 milliseconds.

35. (Canceled).

36. (Original) A method according to Claim 28 wherein the detected mechanical property comprises a measurement of stiffness.

37. (Original) A method according to Claim 28 wherein the detected mechanical property comprises a measurement of a recovery time constant.

38. (Original) A method according to Claim 28 wherein the detected mechanical property comprises a measurement of displacement.

39. (Original) A method according to Claim 28 wherein the detected mechanical property comprises a measurement of viscosity.

40. (Original) A method according to Claim 28 wherein the detected mechanical property comprises a measurement of the time for the tissue to reach a peak displacement.

41. (Original) A method according to Claim 28 wherein the detected mechanical property comprises a measurement of a mechanical property of a blood vessel wall.

42. (Original) A method according to Claim 28 wherein the detected mechanical property comprises a measurement of a mechanical property of tissue surrounding a vessel wall.

43. (Original) A method according to Claim 28 further comprising:

for each of the at least two timing points, detecting a mechanical property of at least two layers of the vessel wall and/or cardiac tissue to provide additional values associated with the mechanical property at the at least two layers; and

comparing first and second values and the additional values.

44. (Original) A method according to Claim 28 wherein detecting the mechanical property comprises:

detecting the mechanical property of a vessel wall and/or cardiac tissue during systole of the cardiac cycle; and

detecting the mechanical property of a vessel wall and/or cardiac tissue during diastole of the cardiac cycle.

45. (Original) A method according to Claim 29 further comprising generating a displacement map at the two timing points during the cardiac cycle.

46. (Original) A method according to Claim 29 further comprising:

generating a plurality of two-dimensional displacement maps from a plurality of initial positions and displaced positions for each of the target regions to produce a plurality of two-dimensional displacement maps; and then

combining the plurality of two-dimensional displacement maps into a single combined map, with a region of increased stiffness being indicated by a region of decreased displacement within the combined map.

47. (Currently Amended) A method for evaluating a blood vessel and/or cardiac tissue in a subject comprising:

delivering an acoustic radiation force pulse to a blood vessel and/or cardiac tissue;

detecting a first value associated with [[a]] the mechanical property of a vessel wall and/or cardiac tissue at a first spatial point within a first layer of the vessel wall and/or cardiac tissue;

detecting a second value associated with the mechanical property at a second spatial point of the vessel wall and/or cardiac tissue within a second layer of the vessel wall and/or cardiac tissue; and

comparing the first and second values~~, wherein the detected mechanical property comprises a dynamic response to radiation force excitation~~.

48. (Currently Amended) A method according to Claim 47 wherein a target region comprises blood vessel wall and/or cardiac tissue and wherein delivering an acoustic radiation force pulse and detecting a first and/or second value associated with a mechanical property comprises:

delivering a first tracking pulse from an ultrasound transducer array having a plurality of elements to a target region within a medium;

receiving a first set of tracking signals from locations in the target region responsive to the tracking pulse in the target region to detect an initial position for the target region;

delivering a pushing pulse from the ultrasound transducer array to the target region to displace the target region to a displaced position;

delivering a second tracking pulse from the ultrasound transducer array to the target region; and

receiving a second set of tracking signals from locations in the target region responsive to the second tracking pulse in the target region to detect the displaced position of the target region.

49. (Original) A method according to Claim 48 wherein:

delivering a first tracking pulse comprises delivering the first tracking pulse at a first intensity level; and

delivering a pushing pulse comprises delivering the pushing pulse at a second intensity level that is greater than the first intensity level.

50. (Original) A method according to Claim 49 wherein:

delivering a second tracking pulse comprises delivering the second tracking pulse at the first intensity level.

51. (Original) A method according to Claim 49 wherein the second intensity level is a range between about 1.0 W/cm2 and about 10,000.0 W/cm2.

52. (Original) A method according to Claim 49 wherein the first intensity level is less than about 1.0 W/cm2.

53. (Original) A method according to Claim 49 wherein the step of delivering a pushing pulse comprises delivering the pushing pulse for between about 0.025 and about 10 milliseconds.

54. (Previously Presented) A computer program product for controlling ultrasound signals comprising:

a computer readable medium having computer readable program code embodied therein, the computer readable program code comprising:

computer readable program code configured to deliver a pushing pulse for between about 0.025 to about 10 milliseconds from an ultrasound transducer array having a plurality of elements to a target region within a medium to displace the target region to a displaced position;

computer readable program code configured to deliver a tracking pulse from the ultrasound transducer array to the target region; and

computer readable program code configured to receive a plurality of tracking signals from locations in the target region, each tracking signal being responsive to the tracking pulse, wherein the plurality of tracking signals comprise parallel beam formed signals.

55. (Canceled).

56. (Original) A computer readable program product according to Claim 54 wherein the tracking signal detects the displaced position of the target region.

57. (Original) A computer readable program product according to Claim 54 further comprising

computer readable program code configured to deliver an initial tracking pulse from the ultrasound transducer array to the target region prior to the pushing pulse;

computer readable program code configured to receive an initial set of tracking signals responsive to the tracking pulse from locations in the target region to detect an initial position for the target region.

58. (Original) A computer readable program product according to Claim 57 wherein the tracking pulses comprises a de-focused beam with respect to the target region.

59. (Original) A computer readable program product according to Claim 57 wherein the tracking signals comprise multiple sums of differently focused focal delayed signals received at each of the plurality of elements in the ultrasound transducer array.

60. (Original) A computer readable program product according to Claim 57 wherein:

the computer readable program code configured to deliver the tracking pulse comprises computer readable program code configured to deliver the tracking pulse at a first intensity level; and

the computer readable program code configured to deliver a pushing pulse comprises computer readable program code configured to deliver the pushing pulse at a second intensity level that is greater than the first intensity level.

61. (Original) A computer readable program product according to Claim 60 wherein:

the computer readable program code configured to deliver an initial tracking pulse comprises computer readable program code configured to deliver the initial tracking pulse at the first intensity level.

62. (Original) A computer readable program product according to Claim 60 wherein the second intensity level is a range between about 1.0 W/cm2 and about 10,000.0 W/cm2.

63. (Original) A computer readable program product according to Claim 60 wherein the first intensity level is less than about 1.0 W/cm2.

64. (Previously Presented) A computer program product for evaluating a blood vessel and/or cardiac tissue in a subject comprising:

computer readable program code configured to detect a mechanical property of a vessel wall and/or cardiac tissue to provide at least first and second values associated with the mechanical property at at least two timing points during a cardiac cycle of the subject; and

computer readable program code configured to compare the first and second values, wherein the detected mechanical property comprises a dynamic response to radiation force excitation.

65. (Previously Presented) A computer readable program product for evaluating a blood vessel and/or cardiac tissue in a subject comprising:

computer readable program code configured to detect a first value associated with a mechanical property of a vessel wall and/or cardiac tissue at a first spatial point within a first layer of the vessel wall and/or cardiac tissue;

computer readable program code configured to detect a second value associated with the mechanical property at a second spatial point of the vessel wall and/or cardiac tissue within a second layer of the vessel wall and/or cardiac tissue; and

computer readable program code configured to compare the first and second values wherein the detected mechanical property comprises a dynamic response to radiation force excitation.

66. (Previously Presented) An ultrasound system comprising:

an ultrasound transducer array controller configured to deliver a pushing pulse for between about 0.025 to about 10 milliseconds from an ultrasound transducer array having a plurality of elements to a target region within a medium to displace the target region to a displaced position, to deliver a tracking pulse from the ultrasound transducer array to the target region, and to receive a plurality of tracking signals from locations in the target region, each tracking signal being responsive to the tracking pulse, wherein the plurality of tracking signals comprise parallel beam formed signals.

67. (Original) A system according to Claim 66 wherein the tracking signal detects the displaced position of the target region.

68. (Original)A system according to Claim 66 wherein the ultrasound transducer array controller is further configured to deliver an initial tracking pulse from the ultrasound transducer array to the target region prior to the pushing pulse, and to receive an initial tracking signal responsive to the tracking pulse in the target region to detect an initial position for the target region;

69. (Original)A system according to Claim 68 wherein the tracking pulses comprises a de-focused beam with respect to the target region.

70. (Original)A system according to Claim 68 wherein the tracking signals comprise multiple sums of differently focused delayed signals received at each of the plurality of elements in the ultrasound transducer array.

71. (Original)A system according to Claim 68 wherein the ultrasound transducer array controller is further configured to deliver the tracking pulse by delivering the tracking pulse at a first intensity level, and to deliver a pushing pulse by delivering the pushing pulse at a second intensity level that is greater than the first intensity level.

72. (Original)A system according to Claim 71 wherein the ultrasound transducer array controller is further configured to deliver an initial tracking pulse by delivering the initial tracking pulse at the first intensity level.

73. (Original)A system according to Claim 71 wherein the second intensity level is a range between about 10.0 W/cm2 and about 1000.0 W/cm2.

74. (Original)A system according to Claim 71 wherein the first intensity level is about 0.72 W/cm2.

75. (Previously Presented) A system for evaluating a blood vessel and/or cardiac tissue in a subject comprising:

an ultrasound transducer array controller configured to detect a mechanical property of a vessel wall and/or cardiac tissue to provide at least first and second values associated with the mechanical property at at least two timing points during a cardiac cycle of the subject, and to compare the first and second values, wherein the detected mechanical property comprises a dynamic response to radiation force excitation.

76. (Original) A system according to Claim 75 wherein a target region comprises blood vessel wall and/or cardiac tissue and wherein the ultrasound transducer array controller is further configured to detect a mechanical property by

delivering a first tracking pulse from an ultrasound transducer array having a plurality of elements to a target region within a medium;

receiving a first set of tracking signals from locations in the target region responsive to the tracking pulse in the target region to detect an initial position for the target region;

delivering a pushing pulse from the ultrasound transducer array to the target region to displace the target region to a displaced position;

delivering a second tracking pulse from the ultrasound transducer array to the target region; and

receiving a second set of tracking signals from locations in the target region responsive to the second tracking pulse in the target region to detect the displaced position of the target region.

77. (Original) A system according to Claim 76 wherein:

the ultrasound transducer array controller is further configured to deliver the first tracking pulse by delivering the first tracking pulse at a first intensity level, and to deliver a pushing pulse by delivering the pushing pulse at a second intensity level that is greater than the first intensity level.

78. (Original) A system according to Claim 76 wherein:

the ultrasound transducer array controller is further configured to deliver a second tracking pulse by delivering the second tracking pulse at the first intensity level.

79. (Original) A system according to Claim 76 wherein the second intensity level is a range between about 1.0 W/cm2 and about 10,000.0 W/cm2.

80. (Original) A system according to Claim 76 wherein the first intensity level is less than about 1.0 W/cm2.

81. (Previously Presented) A system according to Claim 76 wherein the step of delivering a pushing pulse comprises delivering the pushing pulse for between about 0.025 to about 0.5 milliseconds.

82. (Previously Presented) A system for evaluating a blood vessel and/or cardiac tissue in a subject comprising:

an ultrasound transducer array controller configured to detect a first value associated with a mechanical property of a vessel wall and/or cardiac tissue at a first spatial point within a first layer of the vessel wall and/or cardiac tissue, to detect a second value associated with the mechanical property at a second spatial point of the vessel wall and/or cardiac tissue within a second layer of the vessel wall and/or cardiac tissue, to compare the first and second values, wherein the detected mechanical property comprises a dynamic response to radiation force excitation.

83. (Original) A system according to Claim 82 wherein a target region comprises blood vessel wall and/or cardiac tissue and wherein the ultrasound transducer array controller is further configured to detect a mechanical property by

delivering a first tracking pulse from an ultrasound transducer array having a plurality of elements to a target region within a medium;

receiving a first set of tracking signals from locations in the target region responsive to the tracking pulse in the target region to detect an initial position for the target region;

delivering a pushing pulse from the ultrasound transducer array to the target region to displace the target region to a displaced position;

delivering a second tracking pulse from the ultrasound transducer array to the target region; and

receiving a second set of tracking signals from locations in the target region responsive to the second tracking pulse in the target region to detect the displaced position of the target region.

84. (Original) A system according to Claim 83 wherein:

the ultrasound transducer array controller is configured to deliver the first tracking pulse by delivering the first tracking pulse at a first intensity level, and to deliver a pushing pulse by delivering the pushing pulse at a second intensity level that is greater than the first intensity level.

85. (Original) A system according to Claim 84 wherein:

the ultrasound transducer array controller is further configured to deliver a second tracking pulse by delivering the second tracking pulse at the first intensity level.

86. (Original) A system according to Claim 84 wherein the second intensity level is a range between about 1.0 W/cm2 and about 10,000.0 W/cm2.

87. (Original) A system according to Claim 84 wherein the first intensity level is less than about 1.0 W/cm2.

88. (Original) A system according to Claim 84 wherein the ultrasound transducer array controller is further configured to deliver a pushing pulse by delivering the pushing pulse for between about 0.025 and about 0.5 milliseconds.